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THE EXISTENTIAL PROPOSITION[1]

AS we discuss with our fellow philosophers the meaning of the word "to exist" or as we read recent writings by members of different philosophical parties in the hope of discovering some general agreement regarding the usage of this word, we are astonished at the amount of disagreement and even of confusion. Not only do we disagree in our theory of reality, but we do not agree even as to what we mean by the word "reality." Now, is this difference in usage a matter only of words, due chiefly to imperfect logical analysis; or is it the valid result of conflicting solutions of the same philosophical problems? The more I have studied the question, the more have I come to believe that the difficulty is verbal and not genuinely metaphysical, and that some established usage of the word "to exist" would help philosophers to cooperate to a greater extent than they now do.

How ought we, then, to define the word "to exist"? I reply: With the minimum of ontological assumption; for the definition of existence ought not itself to be an ontology. How can we define it with the minimum of ontological assumption? By defining our notion, if possible, in terms only of formal logic. True, logic itself may be an ontology; still it is the minimum, and moreover is unavoidable. The problem of this paper is accordingly: Can existence be defined in terms only of formal logic? To solve this problem we shall try to show that some prominent specific uses of the word "existence" in daily life and in recent philosophy can be brought under a generic definition which employs only logical notions.

Let us begin with the question: What is meant by the philosophical mathematician when he informs us that mathematics is a non-existential science? Mr. Russell gives us a clear answer to this question. The propositions of mathematics are of the form "p im-

[1] A paper read at the meeting of the American Philosophical Association, Princeton, December 29, 1910.

plies q'' where we do not know whether or not p and q are true, but only that if p is true, q is true. This characteristic is the basis for calling the science non-existential. All of which implies that the propositions of an existential science are of a form where either q is asserted or both p and q are asserted. Applied mathematics is of the latter type; for here, accepting some given, empirically ascertained information and assuming certain mathematical theorems to be true, we deduce their consequences. In short, giving p a value that we accept as true, we deduce q. On the other hand, the atomic theory in chemistry is of the former type, for here we know certain experimentally ascertained chemical laws to be true and seek a premise, or explanation, from which they can be deduced. In short, we know q to be true, we discover that p implies q, and therefore assert p as true. Thus in both cases p is asserted, and the propositions of our science are of the form "p, therefore q." Thus the mark that differentiates an existential science from a non-existential science is that in the existential science all propositions are asserted. Now let us adopt tentatively this account of the nature of an existential science; for, if it is accurate, we can by its means define existence in terms of formal logic only.

Our account suggests that there are two types of existential science, which must now be described at greater length. In the first we have the application of science, and our clearest examples are taken from applied mathematics. In applied mathematics we take rational dynamics as true, then by giving certain values to our terms we deduce the consequences; or else in addition to rational dynamics we use as premises some empirically ascertained laws and then deduce q. For example, getting from experience the coefficient of friction between wood and iron, we can deduce the circumstances in a given case when slipping will be just about to take place. Or again, though no man has constructed a 100,000-ton ship, the naval architect can predict with confidence the behavior of such a ship of a given plan. His assumptions will be taken in part from pure mathematics and in part from empirically ascertained information. Perhaps as simple an illustration as any is that our theoretical mechanics assumes the Euclidean geometry to be true, and that on this and further assumptions it often asserts what has never been otherwise tested. In short, p is true, therefore q is true.

In the second type existential theory is markedly different; for in it we do not proceed by assuming certain premises and therefrom deducing q; rather, we have given us q, and seek a system of premises p from which q can be deduced. This process we shall call *explanation,* which may then be defined as any consistent system of

propositions from which given propositions can be deduced. This definition reveals one of the difficulties with which the mind of man has to contend, a difficulty so often illustrated in the history of science. As far as logic is concerned, q does not imply the truth of p from which q follows. Thus the Ptolemaic astronomy, the corpuscular theory of light, and many another outgrown theory served admirably as an explanation of some system of propositions q; but when more and more propositions were added to q, the old theory had to be altered and sometimes had to be rejected, when another theory p^2 could do the explaining either more simply or more completely. Scientific method has of course sought to protect us against this logical shortcoming by demanding that we shall put our new explanations to additional tests; for we are usually required to deduce some further propositions q^2 or q^3 from our theory and then test the truth of these, in short, to verify in part our explanation. Yet an absolutely complete verification is impossible, and therefore all our explanations claim our assent ultimately because a body of accredited information q can be deduced from them. That is, q is true; therefore p, which implies q, may also be true. A good illustration of this type of existential proposition is Weismann's theory of germinal selection. Nobody knows whether it is true or not, that is, whether germinal selection takes place or not, and the only ground Weismann has for asserting it is his conviction that the animal and plant variations found in nature can be deduced from his theory.

Few besides philosophers, to whom it is trite information, realize to what a great extent not only the existent world of science but even that of daily popular life is believed in and accepted as a matter of course, simply and solely because it is just such an explanation of accredited fact and of our hourly experience. This belief includes not merely some new scientific hypothesis, such as the corpuscular theory of matter, but countless commonplace propositions, such as that the earth is a sphere and moves on its axis. Therefore, if this account of the nature of existential science is accurate, the world, the belief in whose existence the people of all civilized lands have in common, may be described simply as our best results in the attempt to explain the experiences of daily life. This explanation in the main has been tested so thoroughly and by so many people that we accept it as unquestionably true. None the less, we know it is subject to change, for it has been greatly changed in the past, and many besides pragmatists admit that it will ever be in course of growth and modification.

These two types of existential proposition are familiar to the student of the history of philosophy. In the former we have the ideal of the dogmatic rationalist, and in the latter the ideal of the

critical empiricist. If only we could discover a system of true and fundamental propositions p, from which all other true propositions can be deduced, we might with Spinoza view reality *sub specie æternitatis*. To-day we may differ, as men in other ages have differed, as to whether or not reality is fundamentally logical. To those who believe it is alogical, of course the ideal of Spinoza is not only unattainable by the finite mind, but is essentially false and impossible. However, this question is beside the issue of the present paper. All men give science and common sense some place, and Spinoza's ideal attained would be but the carrying out to completion of what all men, learned and unlearned alike, attempt to do almost every moment of their daily life, namely, to foresee the future. We differ perhaps regarding the size of such an ideal fundamental system from which all other true propositions can be deduced. Some of the old dogmatists talked as though such a system would not be unmanageably large; whereas others held that nothing less than an infinitude of propositions could satisfy the conditions of the problem, and that we must therefore be content with a general science which will never give us the detail of the existent world, but only its broadest outlines. Thus in applying mathematics we have to substitute values for the variables and constants of our formulæ, since no mathematics could possibly predict for us the values we may happen to need on this or that occasion in future history. This must be left for the occasion itself to supply. So, too, science everywhere strives to find the continuous in nature, though no part of nature ever lacks the discontinuous. No two acorns are alike, and probably no two atoms of hydrogen are alike; and if the ether is made up of particles, probably no two are alike. Thus all our formulæ apply to classes, but not to the individual members as such. However all of this may be, our definition of reality would remain the same, it would be that ideal set of propositions p, finite or infinite, from which all other true propositions q would follow.

In the second type we have, as was said, the ideal of the empiricist. Here the existential proposition is of the form "q being true, p is true, since it implies q"; and we may add, all existential propositions are thus instances of induction, that is, are in part guesses. All existential systems of this type assert certain propositions as true. Why they are true, or what is the nature of truth, is not our present problem. Enough that in such systems these propositions are asserted; and that as the presuppositions of such systems they are data. These asserted propositions constitute for us in daily life that body of accredited fact which every man accepts on penalty of being regarded as insane if he does not.

Of course this body of accredited fact proves at once upon analy-

sis to be in itself an existential system, but an existential system so old and so thoroughly tested that all men accept it. However, as an existential system it is an induction, and it too rests upon some more nearly ultimate group of propositions q. This q in turn may prove likewise to be an existential system resting on a still more nearly ultimate q as presupposition. So the question arises: Are there ultimate propositions q that are self-evidently true, or at any rate are known infallibly to be true, and that as such form an ultimate presupposition on which this or that existential system rests? This question I have answered in the affirmative in papers read before this Association at earlier meetings,[2] but I believe and hope that in the present problem we can leave the question quite an open one. My only contention is that all existential propositions of this type have presuppositions which are asserted; and I call such an assertion a datum.

A new question now arises: Are not these two types of existential science, the deductive and the inductive, compatible? Indeed, will they not in the end give us the same system of reality? The affirmative answer would be given, if I mistake not, by all or surely almost all philosophers and scientists. How far one method is to be preferred to the other, or which must come first, deduction or induction, and similar questions are for the present discussion irrelevant. It is, however, of importance to define the term reality as that term will be used in the one or the other type of existential science. Both mean by reality p, the sufficient ground of all true propositions q. For the one p is datum and q is deduced, whereas for the other q is datum and p is induced; but in either case q is true, and the problem of reality is to discover its sufficient ground. Reality, therefore, is the sufficient ground of all true propositions,[3] that is, it is a complete, self-consistent system from which any true proposition q or

[2] As an extreme empiricist I hold that there is only one ultimate test of truth, namely, reference to fact. By fact I mean perceived truth. Thus q is ultimately fact; and I should express the two types of existential proposition preferably as follows: First, given a theory that we believe to be true, we deduce its consequences, which must agree with fact; or, second, given facts, we invent an hypothesis which will explain these facts and then assert the hypothesis as true theory.

[3] For reasons given in a preceding note, I find this statement awkward. As an empiricist I should prefer to say: Reality is the sufficient ground of all fact, or perceived truth. I believe this view quite agrees with that of Hume. If the causal relation is reducible to that of implication or at least is a type of implication, another way (Hume's way) of putting the foregoing definition is: Reality is the cause of the perceived. *E. g.*, I hear a noise and say a trolley car is passing in a neighboring street. In thus asserting the existence of this event I am only asserting the cause of the perceived event. In short, the notion of existence presupposes always the notion of cause.

datum q can be deduced. Is it also the necessary ground? That is, is there only one system of reality? I know of no purely logical answer to this question. I admit that we have, or seem to have, in our methodologies a further but non-logical postulate, to wit, as q becomes more and more extensive and complex, there can be only one system p that can imply it; for it is usually assumed that there is but one true existential system. But is this not an ontological assumption, and one of the sort our definition should avoid? Indeed, I believe, this very postulate is a prime issue between philosophers to-day; for did we make the views of Mach and Pearson thoroughly explicit, we should, if I mistake not, find this to be a chief difference of opinion between them and their opponents. Therefore, I repeat, our definition of existence ought not to imply that there is only one p that can imply q. It ought to leave open the question whether or not the real is unique.

Before proceeding further we must examine briefly certain assumptions that we have implicitly made in our definition. In the first place, truth is not to be confused with existence, for many propositions are true which are not existential. This seems to me to shut out one historic definition, namely, that existence is an absolute position; for how is truth any less an absolute position than is existence? In the second place existence should be kept distinct from mere fact, or, as it is usually called, the content of immediate apprehension. This is not done by some philosophers, for they argue that existence is immediately apprehended and that it is something ultimate and indefinable. Let us grant that all existence is fact, that in fact we have our only immediate acquaintance with existence and that therefore its very nature is here uniquely revealed to us. Will this admission on our part annul our definition? I believe not, and for the following reasons: First, the business of the existential judgment is not to reveal the nature of existence, but to tell us what exists; and as Hume told us long ago, we never learn from observation alone what exists. Indeed, all will admit that most existential judgments are inductions, that the world, or the existent, is a far vaster system than man can apprehend, and that we assert the existence, for example, of Cæsar and of the center of the earth not because we observe them but because we place them in this vaster system.[4] Secondly, even though we learn from immediate experience alone what it is to exist, immediate experience is not a complete method of discovering existence. Postulates of some sort must help out observa-

[4] Merely to see an object would not be to assert its existence, but *to see it and to react* to it would be. In other words, were we seeking a definition in terms of psychology, we should define an existent as that to which we react, or again as that which guides conduct.

tion. In other words, what we are endeavoring to define is the existential proposition and that larger system which it implies; and there is no reason to believe that either is indefinable or that either is revealed in immediate experience.

To return to our main line of thought, let us ask the all-important question: Can the various species of existential system be brought within this generic type aforegiven? When we use the word "exist" in daily life, in science, or in philosophy, do we mean what our definition indicates, or at least do we mean something that can come under our definition as a species under a genus? The answer to this question is of course the true test of our definition, and until this test has been successfully passed all the foregoing is but the exposition of a tentative definition. In this test our business is not either to prove or to refute anybody's conception of reality, but to be as non-partisan as we can. The only criticism that we are called upon to make is the one already pointed out, no definition of reality ought itself to be an ontology; for our definition of reality should be as catholic as logic permits and surely so, as long as men have radical differences of conviction as to what exists.

The first use of the word "to exist" which we shall consider is that involved in the common-sense empiricism of daily life. Consider the following propositions: "The desk at which I am writing was my father's." "It rained here a week ago." "Our steamer will arrive to-morrow." "You will find him in the next room." "If you use this recipe, you can not fail." "Heat makes wax melt." "Lead is heavier than wood." "Yellow is brighter than blue." "Nine times nine is eighty-one." "David Copperfield lived in London." "Some of the Lilliputians tied him to the ground with threads."

Which are existential and which are not, and how are we to tell? Some of them are clearly existential, and lend themselves to no other interpretation. Others, such as "Yellow is brighter than blue," "Heat makes wax melt," might be true though at the moment no yellow or heat existed. However, when we pass such judgments as these last, we usually believe that such things either do exist or will exist, or at least have existed; for otherwise our assertion would often be meaningless. Nevertheless, we do not assert existence explicitly, just because it is probably superfluous or irrelevant to the information we wish to convey. These propositions might be conceivably true if heat or yellow never existed. It may then be said that particularity makes a proposition existential. As we are using the word existential I do not believe that this expresses the whole truth. Are the propositions, "David Copperfield lived in London," or "Some Lilliputians tied him," existential? No, and

why not? Because they are fiction and because they are not lies? If they were lies they would be existential; but as a correct account of fiction, or even as false, if they are meant as an account of fiction, they are not existential. This shows that some particular propositions are not existential.

Yet it is true that the particular is more explicitly existential than is the universal; because the particular usually *makes an explicit reference to fact.* When a man tells us, "He is my brother," the word "he" is a *direct reference*[5] *to something that makes it impossible to interpret his words as fiction.* If existentially the man has no brother, the man lies; and if the object indicated by the word "he" is not that brother the man lies; and all of this is true because of the reference to fact. He is interpreting fact and he indicates *what* fact. The same is equally evident in "*I* have a brother," "*My* father has a brother," "It rained *here* a week ago," "You will find *him* in the *next* room," "*The* clock does not go." All of these judgments *point* to what they are interpreting. Precisely as when we give the longitude of a place we leave its location quite indeterminate, unless we include east or west of such and such a fixed place; so also in our propositions, if we in no way indicate concerning what facts we are passing judgments, our judgments may be fiction or non-existential. Now singular and particular judgments usually do in some way, either by our gesture, the position of our bodies, or by our surroundings, or by the preceding discourse, make themselves determinate by a reference to fact. In short, they have an additional element that is of their very essence, though often non-verbal—namely, they point out to what they refer. If we omit from our interpretation of these judgments this "pointing out," we omit that which makes them existential.

We may then express the essence of an existential judgment thus: "This very statement is an interpretation of, or is true of, that object or objects." "That object" is common to our perception or thought. "That object" will indicate unambiguously to you of what I am talking, and will be your chief clue in ascertaining whether or not what I say is true or false. "That object" is our logical starting-point.[6]

Is this not our tentative existential proposition of the second type? I believe so. "That object" is the *q*, the datum. Our judgment interpreting "that object" or holding of that object is the *p*

[5] This "pointing out" or "reference" to be found in existential judgments was first called to my attention by my friend, Professor Edwin B. Holt.

[6] This comes out very clearly in instances of illusion where we are quickly corrected. "That is a man standing in my room; why no, it is my overcoat." "That house is on fire; no, it is the setting sun shining on a window."

which implies or presupposes q. p must conform to q or our existential proposition is false, for p implies precisely that q, and our only warrant for asserting p is that it does thus imply "that object." "He is my brother" indicates q. You may examine the fact q as you will, if you find aught that is inconsistent with my statement "He is my brother," I have logically admitted from the start that my proposition is false. If its truth thus depends upon its implying q, its being consistent with q, its being false unless q is such and such, then its very structure is p implies q; and we may restate it, "He is my brother implies that object."

On the other hand, we have admitted that when we say, "Yellow is brighter than blue," "Heat melts wax," "Lead is heavier than wood," "Nine times nine is eighty-one," we do usually pass an implicit existential judgment. We mean more than if x is an a, x is a b, for we mean that there are cases of x. Not merely can heat melt wax, heat does melt wax sometimes. Not merely would yellow be brighter than blue if there were such terms, but there are such terms. In short, these propositions do usually refer to fact, but they do not clearly point out here and now the facts they presuppose. However, since these propositions do imply that there are facts with which they are consistent, we can logically make inferences from them regarding what is true to fact. Thus to bring out explicitly the existential import of these judgments we should word them somewhat as follows: "Heat melts wax, implies that if you do thus and thus you will see wax become fluid"; "Lead is heavier than wood, implies if you put lead in water it will sink and if you put wood in water it will float." In short, p implies q and p is true, therefore q is true; and thus it is an existential proposition of the first type.

You ask why all of this is not expressed explicitly in the words of our judgments. Clearly because to do so is superfluous. Our present surroundings, the preceding events of our lives, the earlier part of our conversation, all give our words their meaning. Apart from such a context nine-tenths of our judgments would be unintelligible. To bring this out in our work of logical analysis is of utmost importance, to make it explicit in our daily conversation would be entirely needless and most wearisome.

All of this may perhaps be made clearer and more convincing if we turn our attention from the examples and think of the situation in which man stands as he is called upon to pass judgment as to what exists and what does not. Such judgments are usually perceptual adaptations to environment. We face something, a closed door, to which we react. Without further knowledge on our part, no inspection of the object itself would reveal what we should do or

even that we should do anything. We react by lifting a latch and the door opens. This intelligent act formulated as a judgment would be, if I lift the latch the door will open. p implies q, p is true, therefore q is true. As I fulfil the conditions, that is, make p true, I expect to find q true, I expect to see the door open.

Let us take another instance. I hear a noise and I interpret it "A train is passing." My judgment is my explanation of the noise. The noise q is given; p, if true, would cause me to expect such a noise. In terms of our symbols, q is true, p implies q, therefore p is true. Take another instance, the maiden's thought, "He came to see me yesterday." Evidently this judgment affirms existence. Let us assume that the thought in purely verbal form entered her mind without any apprehension of evidence of its truth, such as the sight of a visiting card, or a mental image of the suitor, or an awareness of what suggested the thought. In short, let us assume the words and nothing more, a thought and a purely verbal one. For this judgment to have any meaning, it must have some reference or connection or implication, it can not hang in mid-air. To discover this reference or implication we may as psychologists have to seek it in purely neural connections and adjustments; or it may make itself evident shortly in the thought context, in the feelings, or in the motor reactions. In either case it may be something which demands an explanation or creates a need for one, a given q whose explanation p is sought. Thus the thought may be the answer of an implicit question, "Why did I get no letter?" On the other hand, we may find that the original thought itself is functioning as though it were a logical starting-point, it leads onward, it is true, and implies, p is true, p implies q, and therefore q is true. Thus the feeling tone accompanying the thought may be implicitly the conclusion, "He is fond of me"; or this q may, as was said, be merely the neural adjustment that is to determine conduct; or again it may be some immediate act or further thought that in turn leads to an act.

Finally, let us take the illusion, "Yonder is a fire!" There is here clearly a reference; and there is here either an interpretation of that which is referred to, or an expectation of what is to come. In the one case, we have p an explanation of the present q; and in the other we have the same p implying a future q^2 or q^3. In a moment a non-q turns up, a new judgment is passed, "It was the sun shining on a window." The former existential judgment is disproved and a new judgment takes its place.

So I believe we shall be able without violence to interpret every case of existential judgment in daily life. Either we meet with some fact or situation calling for an interpretation and often a corresponding reaction; or we are making plans, building systems of judg-

ments, or in some similar way inferring events of the past, the absent things of to-day, or the life the future has in store. In the former case, q stands before us unexplained, and our problem is, What is the p which implies precisely this q? In the latter case we are drawing on our present stock of information p and are inferring the q it seems to imply. All of this is simply saying with Hume that all existential judgments involve the causal postulate, and adding thereto that the causal relation itself is but a specific case of the relation of implication. One event or thing implies another, and when we add to this that either is logically given us, we have asserted existence.

Now the same holds true of the existential proposition in science. In asserting existence the scientist is maintaining that certain established facts and theories imply a q; or he has given him a q in the shape of fact or established theory and he is seeking its explanation. This is much more easily shown to be true than was the similar statement regarding our existential judgments in daily life. In the first place, take the Copernican theory of the solar system. To-day it is unquestionably asserted by all cultured peoples; yet no man has literally seen the planets go around the sun or the earth revolve on its axis. Evidently this theory is asserted for but two reasons: it explains what we see and it enables us to predict what we shall see. The same things may in turn be said of the doctrine of animal and plant evolution, of the geological theories regarding the origin of the earth's strata and of the present topography of its surface, of the atomic theory in chemistry, of the undulatory theory of light, of the kinetic theory of gases, and so on indefinitely. In short, the business of existential science is to explain and to predict the observable. Should it be objected that the business of existential science is rather to describe to us the unobserved and unobservable universe of the present, the past, and the future, we should reply, even granting this to be so, still if we analyze any instance we will of the unobserved existent, we shall find that it is inferred by science and inferred for only two reasons—either it explains what we do observe or believe, or it enables us to predict what we shall observe, or again it does both. That is, the world of science, as well as the world of the most ignorant races of men, is an explanation of the observed or the asserted.[7] It is a p which implies a given q and is asserted because it does so imply.

An excellent test of this analysis of the existential judgment will be to ascertain whether or not we can hold it without contradicting

[7] The word "the asserted" is added because there may very well be cases where the existent is the asserted explanation not only of traditional convictions and beliefs but also of the outright delusions of the superstitious and the insane.

on the one hand the views of Berkeley, Ernst Mach, and Carl Pearson, and on the other those of their opponents. For brevity's sake let us confine our first test to Carl Pearson's familiar doctrine. Pearson tells us that the sciences are merely shorthand devices for describing our sense impressions. Their business is not to tell us what exists, for the only criterion of existence is perceivability. What can not be perceived does not exist, but this does not hinder science describing the perceivable in terms of symbols or fictions, or by any other convenient device.

In the first place I do not believe that Pearson truly means to use the word "describe" here. An atomic theory can not be a description of a perceivable chemical reaction, or an ether theory a description of perceivable light. A description of the perceivable would be a verbal instrument by means of which we arouse in some one's mind mental imagery or thoughts that directly correspond to or copy the perceivable. A novelist describes a character, a newspaper an accident, an historian a battle, a child its dream, a youth his plans; but mathematical physics does not describe an electric spark. If I mistake not, what Pearson means is not "describe" but "explain," as we have used the word. Thus let us not say that such sciences as chemistry, physics, or astronomy literally describe sense impressions; rather let us say that they give us means for inferring what sense impressions have been or will be. But again, let us not say we deduce sense impressions; rather, let us say we deduce propositions that describe the sense impressions or that contain the same information as that revealed to us in sense impression. I believe, then, that we are not altering Pearson's meaning when we say somewhat as follows: We have certain information given us in sense impression; let us call this q. The business of science is to discover a system of propositions p from which q can be deduced most conveniently and economically. Now p is not to be regarded as existential; to regard it so would be to turn mere logical instruments and abstractions into realities. There may be other systems of the class p from which q can be deduced, and they too would then be said to exist. But what system of propositions may be rightly called existential? Only that system the truth of all of whose propositions can be, or has been, directly tested in sense experience. Such a phenomenalist therefore seems to assert that there is but one test of truth, namely, sense impression; mere logical agreement with propositions so tested, or, in general, mere consilience, is not a test of truth. Consequently he demands more of an existential system than do others. It is not enough that q should be true and that p should imply q; p itself must likewise be submitted to the same test of truth as was q. It is not enough that mathematical physics can by some ether hypothesis

deduce laws of light and electricity, which under experimental test are found to be true. To be more than a convenient device, that is, to be an existential system, this hypothesis of an ether would have to be itself directly tested by observation. In short, not only must p imply q, but it must also either be known to be true or be capable directly of proof. Thus we have in p an existential system if q is true and p implies q, and if p is a proposition whose truth admits of being tested by direct observation; whereas if p can not be thus tested, such a system may be good science, but it must not be confused with an existential system. If this interpretation is correct, Pearson's definition of existence would come under the definition that has been aforegiven. The difference is only that he narrows the class of propositions that may be said to exist. The existent is the sufficient condition of our data and is also perceivable.[8]

Additional evidence in favor of our definition of existence will be found if we consider two important rival definitions. The first is widely accepted. It identifies the existential system with the spatio-temporal world, or perhaps more accurately with the temporal world, regardless of whether the system is perceptible or imperceptible. Thus any term is said to exist if it is related to the instants of time, or, popularly put, if it has position in time. This usage, as Russell has shown,[9] gives rise to serious difficulties, but can perhaps be modified so as to be made thoroughly consistent. Now, it seems to me that there are some good reasons for preferring our definition to the present one, if the two are consistent. In the first place, the latter

[8] In Berkeley's doctrine the same result comes out even clearer. Our percepts are but God's messages to us, telling us what future percepts to expect. Thus to say that my friend is in the next room is but to predict the percept you will get if you have the percepts of opening the door and walking in. In short, existence is but the information that implies our percepts. Such also is the meaning of Mill's permanent possibilities of sensation. The idealism or the realism that may go along with these views is for us accidental, a very important point to be noted. The same relation exists between p and q regardless of whether they are only mental states or external non-mental entities. Thus Berkeley's empiricism and nominalism should be kept quite distinct from his subjective idealism.

Our definition of existence would clear up also the ambiguity in the historic question, "Do the secondary qualities exist?" I believe that analysis of the distinction between the two types of qualities shows that difference in implication is at its basis. However, important as a full discussion of this matter would be in justifying or condemning our definition, it would have to be made the subject of a separate paper. My conviction is that our definition of existence could be shown to be at least generic to that implicitly used by the naïve realist and by his opponent.

[9] "Principles of Mathematics," p. 471. Mr. Russell seems to regard existence as ultimate and indefinable; or, at least, I know of no definition which he has given.

assumes that the real world is temporal. This might be harmless enough if we could agree upon a definition of time and be sure that the world is temporal in the sense thus defined. In the second place, to assume or believe that the real world is temporal is not to avoid the awkward question, Does time itself exist? In short, this definition, by implying that whatever exists is temporal, is itself already an ontology, as are the definitions given by the phenomenalists. But to apply our test here as we did there: Can this definition be shown to come as a species under our definition as a genus? To assert that an entity exists because it is a member of the temporal system means more than merely to give it a position in time, for the whole importance of the judgment is that it relates the entity directly to a context and implicitly to the whole world-order. Indeed it would be impossible to assign a date except by so doing; and as Hume showed, the only method by means of which this can be done is a knowledge of causal relations; for the only ground upon which we can construct our knowledge of the past, of the future, and of the unobserved present is either that their terms imply (causally) the terms we do observe, or that the terms we do observe imply their terms. To assert that a Mycenean civilization existed at such and such a remote period is but to assert that data now at hand imply or are implied by this civilization. The same thing holds of any past event, those which we have witnessed as well as those which we have not.

The difficulty with this interpretation is not the statement that such implication is involved as the ground of our existential judgments, but rather the doubt whether or not this is the *meaning* of the judgment. To say that Cæsar existed seems so much simpler than to say, "Cæsar implies some of the facts of our day and is consistent with all our other existential judgments." But we must remember that every judgment we pass, such as locating Cæsar in the first century before Christ, is not a bit of information we believe quite isolated from all other information we have. On the contrary, asserting the position of any term in time is always done by means of a larger system as a logical background. Even to say, "This which I see exists *now*," means to relate the event in question to a larger system of terms which it implies and by which it is implied. That this larger system is only implicitly in our judgments does not make it any the less there. This larger system is the world in which we have gradually come to believe through many influences from childhood till now. Thus when as adults and scientists we assign an event its place in time, we are but extending this world system as known by us. In short, we have but discovered new implications

between parts of the system, and verbally this does not have to be made explicit just because it is a matter of course.

There remains a second definition of existence that must be considered at least briefly because of its great importance, namely, nominalism, "only particulars exist." Evidently this is an ontology and not a definition of existence. As an ontology it contradicts Platonic realism, and this a definition should not do. Moreover, when the nominalist gives us a criterion by which to determine whether or not any given particular exists, he usually has recourse to one of the two foregoing theories of existence, that is, to the doctrine that whatever exists either has definite position in time or is perceivable. In short, his definition of existence is an ontology, as were the preceding, and, like these, can be brought under our definition as a species under a genus.

Thus, we conclude, there are two types of existential proposition: the first type is of the form p implies q where p is asserted, and therefore q is asserted; the second type is of the form q is asserted, p implies q, hence p is asserted. Therefore existence can be defined without any ontological assumption other than that presupposed in formal logic; and if it can, it should be so defined. The existent is the asserted sufficient condition of any true proposition; and accordingly a term is said to exist when it is a member of a proposition that is the asserted sufficient condition of some true proposition.

WALTER T. MARVIN.

RUTGERS COLLEGE.

SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on April 24, 1911. An afternoon session was held at the psychological laboratory of Columbia University and an evening session at the Museum of Natural History. Between these two sessions an informal dinner was held at the Faculty Club of Columbia University. The following program was presented:

A Simple Method for the Study of Entoptic Phenomena: GEO. R. MONTGOMERY.

By using small silver beads strung on a wire in a spectacle frame to reflect light into the eye, we have a simple method which has many advantages in the study of entoptic phenomena. From the stand-

point of psychology, perhaps the most important use of such an instrument is in the study of iris movements. For some experiments it is well to cover the frame with a black cloth, allowing the light to reach the beads through a slit. If three beads are used, they may be moved back and forth and the intensity of the light increased or diminished until the middle circle of light thrown upon the retina is exactly tangent to the other two. Such a contrivance allows a view of both pupils at the same time. It also allows careful measurement of dilation and contraction, and furthermore permits the eye and the body to take an easy, normal position.

The use of a single bead with two or three sources of light enables one to diversify the intensity of the circles of light thrown upon different parts of the retina. This is important in determining the parallax of objects in the eye which throw the shadows. Combinations are possible with this arrangement and other experiments, Purkinje's for instance, and the beads may also be used for throwing circles of lights from colored globes upon the retina. These circles may be superposed, the different parts of the retina compared as to color sensation, the effect of contrast brought out, etc.

The Preferred Length of Interval: J. E. WALLACE WALLIN.

The paper detailed the experimental results of two simple methods of investigating the preferred length of auditory intervals: a method of *impression,* in which a preference was reached by successive comparisons of pairs of metronome clicks in a definite order; and a method of *expression,* in which the preference for musical tempos was determined by measuring the durations between the responses (stamps of the foot) made to musical selections by the gallery patrons in theaters.

The results showed, among other things: that the average interval preference with metronome clicks corresponded precisely with the average tempo of the most vigorous responses to musical rhythms (0.51 sec.); that the very general tendency to rhythmize recurrent auditory impressions of the same intensity (metronome clicks) often rested on an ascertainable qualitative basis; that the tendency to perceive different lengths of auditory intervals as indifferent or neutral is infrequent; that instead of selecting a definite, invariable central tendency in respect to interval preferences, the subjects can be arranged most naturally into a number of types (slow, medium, fast, rapid); that the absence of a clear, definite central tendency is due to the fact that the preferences are determined by varying factors permanently or temporarily operative (physical pain, mental disquietude, repose, strain of suspense or expectation, stimulation to movement, rhythmical tendency, associations, suggestions, preference

for melody, harmony, or rhythm in music, but not musical capacity, etc.); that we can lay down limits within which the preferences for intervals and musical tempos will most probably come (0.40 to 0.70 sec.); and that the vigor of the responses in music varies according as the time is two-four or three-four, and according to the relative influence of other factors than that of speed (catchiness or familiarity of the music, incisiveness of the accent, etc.).

Sex and Class Differences in Response to Advertisements: E. K. STRONG, JR.

In an extensive study of the relative value of the motives, which are used in advertisements, that lead one to buy toilet soap, a number of interesting facts as to class and sex differences were noted. It was found that the order of preference for such motives as were obtained from fifty college students correlated very high with similar orders from educated men and from educated women. In fact there were no specific differences between such orders. But an order of preference from a group of one hundred men living in and about Garrison, N. Y., showed a negative correlation. The striking point about this latter order, however, was not so much that uneducated persons do not agree with educated ones with respect to which are the strong motives, but that they do not agree amongst themselves at all—their order being little more than a chance order. This is the more striking when we realize that two groups of educated women correlated as high as + .93. In this study it was very clear that women are less variable in their judgments as to the merit of these motives or appeals than are men. Not only were the corresponding probable errors of the medians smaller in almost every case among the women, but the various sub-groups of women correlated higher with respect to each other than did the sub-groups of men. Such motives as "beauty" and "for the baby" ranked higher among the women than among the men, but the surprising thing here was that the two sexes agreed so closely with respect to the other motives.

The Curve of Work: E. L. THORNDIKE.

Professor Thorndike reported results of five subjects, each working eight hours (two hours on each of four days) at adding printed examples, each of ten one-place numbers. It was found that initial spurt did not appear at all as a general tendency in all students, or consistently in the work of any one of them. There was a slight tendency to spurt in the last five minutes, but this was very slight and by no means consistent throughout the group, or important in the case of any member of the group. Warming up was found to play a slight and possibly inappreciable part in the curve of work.

The influence of practise and that of fatigue approximately balanced, so that the general tendency of the character of the work is not only toward rectilinearity, but also toward parallelism with the base line.

The Influence of Caffein on the Quality of Sleep: H. L. HOLLINGWORTH.

Sixteen subjects were given doses of caffein alkaloid (1–6 grains), at varying times of day, for a period of a month. Incidentally to a series of mental tests which were continued throughout this period, each subject recorded the approximate number of hours' sleep after each day and graded the quality of the night's rest as "better than usual," "ordinary," or "worse than usual." Adequate control methods were used. Clear individual differences were shown in the effect of the drug on the quality of sleep—and these differences were independent of age, sex, and size differences. On the basis of the squad averages, doses of 1–4 grains do not impair sleep. Doses larger than these produce sleeplessness. This effect is greatest when the dose is taken day after day, allowing a cumulative effect. When a single dose is taken on alternate days, the effect is greatest when the caffein is taken between meals. Taken with meals, its action is weakened and retarded. Only in exceptional cases does sleeplessness follow the 1–4 grain dose, and in many cases a 6 grain dose is without effect. The "approximate number of hours" of sleep does not seem to be modified by the action of the drug, probably because this matter is controlled by a more or less artificial schedule.

Has Psychology Lost Its Mind? W. P. MONTAGUE.

The movement to dispense with the concept of mind or consciousness and to substitute the concept of behavior as the sufficient object of psychological study was criticized (1) on the ground of ambiguity, (2) on the ground of inadequacy.

1. Behavior, as the movement of an organism in response to stimulus, is ambiguous in that it may mean (*a*) the intra-neural current from sensory center to muscle, or (*b*) the extra-neural motion of the organism or its members. Behavior in the first sense might conceivably be the basis of and hence a substitute for consciousness, but it would be invisible to the external observer and therefore relatively useless as an object of psychological study. Behavior in the second sense is visible to the observer, and so a useful *index* of consciousness; but being extra-neural, it could not possibly be the correlate or basis of the organism's own experience. The motor theory of consciousness derives much of its plausibility from an unconscious shifting from one of these meanings of behavior to another.

2. But behavior in either or both of these senses is inadequate as

a substitute for or even as a correlate of consciousness, (*a*) because, unless evidence is given for an innervation sense, it can only be the kinesthetic sensations that *result from* one's movement, and never the movement itself, that one experiences; hence to reduce consciousness to movement would be to reduce all sensations to kinesthetic sensations; (*b*) because the field of consciousness is infinitely too rich a manifold to be put in one to one correspondence with any system of mere motions, internal or external.

The Spread of Christian Science: I. WOODBRIDGE RILEY.

From recent investigations made by Professor Joseph Jastrow comparing the results of the Federal Census of 1910 with the number of advertised Christian Science practitioners, there is shown a threefold distribution of the sect, chiefly in three pairs of states: Massachusetts and New York, Illinois and Missouri, Colorado and California. Here the pathological factor is first in evidence, for the centers of influence are large cities, with their concomitant nervous disorders, and the health resorts of the mountains and coast. A second factor is that of free thought, or a liberal attitude toward the unconventional such as is found in the given states, with their large cities and their great number of imported foreign faiths. A third factor is financial, a reaction from overmuch material prosperity and a leaning towards a somewhat ascetic immaterialism. This leads to the final factor, the previous idealisms which prepared the soil, such as New England transcendentalism, with the Emersonian call to the "demonstration" of the "spiritual principle," and the German idealism represented in the St. Louis School. These four factors apply not only to the followers of Christian Science, but to the founder; and here Eddyism may be considered not only an afterclap of transcendentalism, but a recrudescence of Neoplatonism. As in Rome and Alexandria, so in America there has arisen a demand for knowledge dependent on "divine" communications; a denial of sensible existence; a contempt for reason and physical science, and a destruction of the distinction between sensible and intelligible. In all this Christian Science shows itself a recurrent phase of the larger movement of so-called New Thought, with its occultism, gnosticism, and mysticism. The type of mind to which the movement appeals is complex—practical and yet uncritical, non-academic and yet speculative. Such a mind fails to distinguish the fundamental fallacy of Christian Science—that while it disclaims materialism, it still reeks with material terms such as "mental offshoots," "gravitation Godward," and the "aroma of Spirit." In fine, the "divine metaphysics" bolsters itself up with the latest physical discoveries, such as Hertzian waves and X-rays, to explain "absent treatment" and silent "demonstration."

Psychanalysis and the Interpretation of Dreams: E. W. SCRIPTURE.

Psychanalysis is the term applied to the line of work originated by Freud, of Vienna. Its chief object is to get at the facts of the subconscious. One of its most effective methods is the analysis of dreams. The immediate facts in the dream, the "manifest content," are derived from the immediately preceding experiences of life. The "latent content" is deduced from the "manifest content." The "latent content" of a dream always consists of a wish or fear. A child disappointed by the size of some Bantam chickens dreamed that she had large Cochin Chinas and thus satisfied her wish. A man dreams that he is bald because he has noticed his hair to be getting thin and fears that he will become bald. The "manifest content" of the dream is often symbolic of the "latent content." After a consultation with his physician in which the disagreeable experiences of his past life are discussed, a man dreams of being in a laundry watching the clothes boil in the tank. His dream satisfies the wish to see his "dirty linen" washed clean. A man in financial difficulties dreams of being caught in a terrific snow-storm. This expresses his fear of being "snowed under."

By psychanalysis the physician gets an accurate knowledge of the patient's mental make-up; this he can get in no other way. He can then proceed to correct the various defects of character such as egotism, stubbornness, viciousness, bashfulness, timidity, etc. Psychanalysis is the only radical cure for hysteria, the phobias, and psychasthenia.

H. L. HOLLINGWORTH,
Secretary-Treasurer.

COLUMBIA UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

Light and the Behavior of Organisms. S. O. MAST. New York: John Wiley and Sons. 1911. Pp. xi + 410.

"This volume is the outgrowth of an intensive and extensive study of the processes of orientation in plants and animals, especially those without eyes, *i. e.*, a study of the perplexing and interesting question as to how these organisms regulate their activities so as to bend or move toward or from the source of stimulation. But while the book deals primarily with the question of orientation, it has a broader aspect and may be considered a treatise on the behavior of organisms based on their reactions to light."

The author of this thoroughgoing discussion of the influence of light upon the activities of organisms has made his book doubly useful by prefacing his original observations by a history of the problems of reac-

tion to light. With respect alike to the historical sketch and the original materials, the work is excellent.

During the last twenty years a large number of observers have studied reactions to light as exhibited by plants and animals. Early in the history of this work the phenomenon of orientation attracted attention and stimulated observers to the formulation of explanatory hypotheses. About these hypotheses there has accumulated an interesting, if not over-profitable, controversial literature. It is to be hoped that Mast's clear and concise review of this subject, in connection with his important observations of the orientation processes in a number of organisms of widely differing forms, may direct research to the problems whose solution must determine the fate of the hypotheses which have tended to monopolize attention.

In his bibliography the author lists about three hundred and twenty-five titles, of which almost all concern the influence of light on organisms.

By parts the contents of the volume may be described briefly in this manner: I., historical review; II., observations concerning the bending, turning, or moving of organisms with respect to a light; III., adaptation, aggregation, variability, and modifiability; IV., reactions to colors.

The book contains admirable summaries of chapters for the use of readers whose interest impels them to seek the results of the author's investigations rather than a knowledge of his methods, but even to epitomize these summaries satisfactorily would demand an inordinate amount of space. We shall, therefore, limit this notice to the quoting of a few sentences of special interest.

Concerning the evolution of responses to light, the author writes: "The most primitive responses to light are probably due to the effect of continued illumination on synthetic and growth processes in green plants. Responses of this nature we may assume to have been the basis for the origin of all others, which probably appeared somewhat in the order following:

"(1) Change in the rate of locomotion dependent upon the absolute amount of light energy received. No orientation, but probably aggregation at the optimum intensity—*Bacteria.*

"(2) Contraction of naked protoplasm due to sudden changes in the light intensity, *i. e.,* changes in the amount of light energy received, resulting in orientation in some instances—*Amœba.*

"(3) Fixed responses (avoiding reactions) caused by sudden changes of intensity, the nature of the response depending upon the structure of the organism. No orientation, but aggregation at the optimum—*Bacteria.*

"(4) Reactions similar to those under (3), but more definitely circumscribed by the structure of the body, especially the localization of tissue sensitive to light. Definite orientation and movement directly toward the optimum—*Stentor,* etc.

"(5) Reactions to a sign. The change in illumination which causes the response is of no consequence to the organism, but the illumination which would follow if it did not respond may be—*Euglena, Volvox,* etc.

"(6) Reactions to a sign. The change of intensity (shadow) which causes the response represents objects which may be beneficial or injurious, food or enemies—*Clepsine, Hydroides,* etc.

"(7) Reaction to a sign. The light condition or configuration which causes the response represents objects, not by means of shadows cast by them, but by means of the light reflected from them expressing size, form, or color—animals with image-forming eyes." (Pp. 262–263.)

Thus briefly may be listed the chief points which the author makes concerning the influence of light:

(1) Movement, and changes in the direction or rate of the same, may occur in the absence of any immediate external change, as stimulus.

(2) Sudden changes in the intensity of light, acting upon sensitive tissues, may cause reactions.

(3) Continued constant illumination may affect rate of movement or, by bringing about reversal of the sense of reaction, direction of locomotion. Time of exposure, as well as intensity of light, influences the response.

(4) Under certain conditions a sudden increase or a sudden decrease in the intensity of light may produce the same response.

(5) A certain photic condition may inhibit one form of response and cause another to appear.

(6) Increase in the general illumination of an organism may cause increased activity, and sudden decrease of illumination may cause even greater activity.

(7) An increase in photic energy may cause the same effect as a decrease of thermal energy.

(8) Certain chemicals may cause a change in the sense of reaction —negative to positive, for example.

(9) The stimulating effect of different portions of the spectrum is specific, but it is not the same for all organisms. With the energy constant, some are the more strongly stimulated by blue, others by violet or ultra-violet, others by green and yellow, and still others by red and infra-red.

(10) "Reactions to light are variable, modifiable, and in general adaptive."

The author interprets his facts as more generally in agreement with the Jennings theory of behavior than with that of Loeb.

The book represents a large amount of extremely careful work, both on the literature of the subject and with reacting organisms. It is fair in its treatment of theories, clear in its presentation of facts, and thoroughly reliable.

CAMBRIDGE, MASS. ROBERT M. YERKES.

Sociology and Modern Social Problems. CHARLES A. ELLWOOD. New York: American Book Company. 1910. Pp. 331.

The purpose of this work, as the author tells us in the preface, is to serve as "an elementary text in sociology as applied to modern social

problems, . . . in institutions where but a short time can be given to the subject." Hence, naturally, it "is not intended to be a contribution to sociological theory," but aims at simple and concrete teaching of elementary principles. We desire to emphasize at the beginning the great importance of this aim: the social sciences have come to hold a dominant place in the general thought of the race, and, like all new elements in thought and life, they must next claim and occupy their place in the education of youth. Already something is being done in college courses in economics, political science, and sociology, and a little in high schools in the way of civics; but no one can doubt that the social element in the curriculum must be greatly enlarged, and that as fast as possible. To this end the first academic requirement is the creation of a body of competent teachers; a second important step is just this of the text-book.

Professor Ellwood has, we believe, made a real contribution, and particularly in this way, that while most other texts are written to introduce the student to the further academic study of sociology, his book is suited to that great majority of students who will necessarily carry on their further study of the subject not in the classroom but in the school of life. The most important feature of the book in this respect is its general make-up, the first part being an introduction to the *elements of sociology,* and the last half being devoted to *social problems* of to-day; that is, the book represents the ground often covered by the first two courses in colleges, sociology and social problems. As things are, very few students get to social problems at all, and yet, for every reason except the purely academic one, social problems should take precedence of sociology: the former course has a more powerful appeal to the interest of the students, and a more direct and lasting relation to their future life and thought; of this one could hardly find a better proof than the list of problems included in Professor Ellwood's book—the modern family (with special reference to marriage and divorce), growth of population, immigration, the negro problem, the problem of the city, poverty, crime, socialism, education; could any topics in the whole range of human thought have a more universal appeal to the interest of students or a more universal value to their future intelligence?

In fact, we are almost convinced that social problems should actually precede the principles of sociology as being the indispensable concrete basis, the laboratory material, as it were, for any true and strong grasp of the theory. We make the suggestion with regard to Professor Ellwood's book itself, whether it would not be better to begin with Chapter VII., "The Problem of the Modern Family," and end with Chapter I., "The Study of Society"? The truth is that Chapter I., like many so-called introductions, is really a conclusion. What is the study of society? It is useless to *tell* the student: he can find out in one way only, and that is to study society, especially in such concrete forms as are discussed in Chapters VII. to XIV.: after he has done this, let him, if you will, look back and ask the question intelligently. Chapter II., by the way, on the bearing of the doctrine of evolution upon social problems, is truly introductory, and exceedingly appropriate.

The task of selecting material for such a text-book is of course a perplexing one: it would be hard to find a field more affected by the embarrassment of riches. It may be questioned whether this book does not allow the extended treatment of the family to crowd out other topics quite essential to even an elementary book: we look in vain for anything but incidental remarks upon the great social forces, as distinguished from the social forms through which they work; besides the student is likely, from mere stress of attention, to forget that business, the school, the state, and the church are also essential forms of human organization.

The chapter on "The Problem of the Modern Family" seems open to some criticism. In the first place its real theme is not the modern family, but only one acute pathological aspect of it, divorce; marriage is treated only incidentally and very scantily; even under the discussion of remedies for the divorce evil, too little attention is paid to our lax marriage laws and customs, and to the probability that better regulation of marriage, both legally, ecclesiastically, and socially, is the most hopeful means of improving the situation as to divorce. Moreover, marriage appeals to a wholesome and natural interest of young people, and thus affords a far better approach to the problem of the family as a whole.

The style is remarkably free from blemishes of any sort; it is clear and readable throughout. One special excellence with respect to the purpose of the book as an introductory text is the absence of all unnecessary technical terms, a point in which it differs greatly from some books written for the same purpose.

There is a wide-spread conviction that there must be an increase of the social sciences in the high school course: why could not such a book as this of Professor Ellwood's be used with classes in the last year of the secondary school? All the experts on adolescence tell us that the high school student is an intensely social creature, and that his mind is reaching out to grasp and comprehend his relations to his fellows. We believe that no branch of human knowledge would have a stronger appeal to the interest of high school youth and that none would more effectively stimulate their powers of thought and reflection; certainly none could contribute more richly to their ability to escape fallacies and attain the truth in the questions they must meet later as citizens and members of community life.

EDWARD O. SISSON.

THE UNIVERSITY OF WASHINGTON.

On the Theory of the Infinite in Modern Thought. E. F. JOURDAIN. Longmans, Green, and Company. 1911. Pp. 55.

This little volume contains two essays read at Oxford in 1905 and 1908 respectively. The first, "The Problem of the Infinite and the Finite," was read before a meeting of women science students; the second, "Pragmatism and a Theory of Knowledge," before a philosophical society.

"The Problem of the Infinite and the Finite" is an exposition of

those modern mathematical researches that Russell and Royce have made familiar. We can summarize the conclusions and applications in the author's own words. "He [the mathematician] starts from the aggregate, which he analyzes into the finite and the infinite, and the latter he analyzes into the transfinite and the absolute" (p. 20). "If the finite deals with numbers, and the transfinite with series of numbers, the absolute deals with series of series" (p. 21). "There is no greatest finite number, but there is a least transfinite number. . . . Beyond the transfinite we can not discover in the absolute the idea of least or of greatest, . . . and in the absolute we can not trace any connection between cardinals and ordinals, *i. e.*, it is possible to have an ordinal series to which there can be no corresponding cardinal number or type. . . . all mathematical processes which find their goal in the absolute would find their annihilation there. No finite mathematical conception would be applicable to it" (pp. 21–23). "Some mathematicians think that it exists, but has no number. It is discovered by a logical process, but defies analysis and the application to it of the notion of number" (p. 23).[1] "Its [the absolute's] philosophical importance is great: the absolute is here, as elsewhere, the goal of human thought, and is the mathematician's name for the highest power discoverable by human reason" (p. 24). "How . . . would Hegel have rejoiced in a definition of thought and existence which would bridge over the logical gulf in his system! Hegel asserted that thought and existence were one. . . . But the mathematician defines existence as something that is not self-contradictory. Thought, then, to him is a form of existence, for thought is not self-contradictory. . . . Hence, to say that non-contradiction is a fundamental condition of true thinking is as much as to say that it is a fundamental characteristic of real existence, and he identifies thought with reality" (pp. 24–25). Happy Hegel!

As to the second essay: Pragmatism has three main difficulties. (1) It has no absolute. "The pragmatist considers that nothing *is* which is not a result of human action, and lowers the divine element to the result of human individual activity" (p. 32). But James is refuted by H. Jones, Ormond, and others. (2) It denies scientific law and logic, the latter by the help of logic. The pragmatist's assumption that laws may work although relative, is greater than the absolutist's assumption of faith. "Each day that the sun goes on rising finds the absolutist in a better philosophical position and the pragmatist in a worse, except on the assumption that the link between man and the external world is a false imagination" (p. 40). (3) It neglects the results of modern mathematical research. (*a*) Royce is right in asserting "that any consistent attempt to make an orderly arrangement of the terms of an infinite whole must lead to the indefinite regress. And he further shows the connection with the fact that an infinite series can be adequately represented by a part of itself" (pp. 43–44). (*b*) Keyser has shown the power of mathematical conceptions to overcome the seeming paradoxes of the Athanasian Creed.

[1] Yet we read (p. 13), "Philosophers, who have never attempted the analysis"—shade of Bradley!—"have been inclined to accept certain contradictions in their conception as inherent in the nature of infinity."

Even the antithesis between the omniscience of God and the freedom of man disappears "if we realize that from the point of view of infinities the dignity and power of omniscience remain the same, even if some part of experience is not yet drawn into the sphere of omniscience" (p. 47). (*c*) And now science needs the fourth, or rather *n*th, dimension of modern geometry, but why this helps out idealism or damns pragmatism the present writer fails to understand.

Perhaps it would be unfair to subject these popular discourses to criticism.

HAROLD CHAPMAN BROWN.

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JOURNALS AND NEW BOOKS

RIVISTA DI FILOSOFIA. January–March, 1911. *Il Caso* (pp. 1–33): C. RANZOLI. – Examines three kinds of chance—common or lacking causality; metaphysical, or lacking finality; scientific, or lacking predictability—and leans to the last, *i. e.*, universal determinism, as opposed to idealism, makes the unpredictable character of a phenomenon a sign not of independence but of causal dependence. *Sulla positività come carattere del diritto* (pp. 34–48): GIORGIO DEL VECCHIO. – The positive is not an essential of the right, but is determined by judicial decisions. *Logica e matematica* (pp. 49–70): CORRADINO MINEO. – Discusses Bertrand Russell's "Principles of Mathematics," Couturat's logistics, and Peano's symbolism. *La filosofia naturale dello Schelling e le nuove correnti del pensiero* (pp. 71–77): MICHELE LOSACCO. – Schelling's view of nature as rational is compared with that of Bergson and the neo-vitalists. *Intuito e sintesi primitiva in A. Rosmimi* (pp. 78–96): P. CARABELLESE. – Intuition is a transcendental condition of perception, synthesis the relation between sensation and the idea of existence. *Del fatto educativo* (pp. 97–116): C. TOMMASO ARAGONA. – The chief factor in education is spontaneous —a phenomenon of becoming proper to the individual. *La guerra, la pace, e la filosofia* (pp. 116–128): G. MAZZALORSO. – War and peace are alternating phases in a determined rhythm. *Un teologo e apologeta riformatore della fisica e dell' astronomia* (pp. 129–134): L. LANZI. – Criticizes Gustavo Pecsi's interpretation of Benedetto Castelli's letter to Galileo Galilei as to the Aristotelian diction concerning the uncreated existence of motion in the universe. *Recensione e cenni. Rivista delle riviste. Notizie. Atti della Società Filosofica Italiana.*

RIVISTA DI FILOSOFIA NEO-SCOLASTICA. April, 1911. *Sigieri di Brabante nella Divina Commedia e le fonti della filosofia di Dante* (pp. 187–195): BRUNO NARDI. – Siger of Brabant, the chief representative of Averroism in the University of Paris, is that same "Sigieri" mentioned by Dante in the tenth canto of the "Paradiso." *Sul fondamento della realtà morale* (pp. 196–211): M. S. GILLET O.P. – The educational value of the Catholic system of morality comes from the divine

absolute upon which the system rests. The apparent force of the modern ethical systems is derived from the same absolute, which they unconsciously admit. *Saggio di esposizione sintetica del pragmatismo religioso di W. James e di F. C. S. Schiller* (pp. 212–231): E. CHIOCCHETTI. – An exposition of the pragmatic theories of James and Schiller on the conception of God and religion. *Note e discussioni. Tribuna libera. Analisi d'opere:* F. Klimke, S.J., *Der Monismus und seine philosophischen Grundlagen:* P. GÉNY, S.J. E. Peillaube, *Les images:* A. GEMELLI. F. Queyrat, *La curiosité:* L. BIANCHI. A. Manzoni, *Osservazioni sulla morale cattolica:* F. LAZZATI. L. Majoli, *Lucere et ardere: Pensiero e storia da Augusto a Dante:* R. FUSARI. B. Croce, *Secondo Supplemento alla Bibliografia Vichiana con appendice di Fausto Nicolini:* E. CHIOCCHETTI. G. Vailati, *Gli Scritti:* A. CAPPELLAZZI. A. Anile, *Vigilie di scienza e di vita:* L. CAVALLI. *Note bibliografiche. Notiziario. Sommario ideologico.*

REVUE DE MÉTAPHYSIQUE ET DE MORALE. May, 1911. *L'importance philosophique de la logistique* (pp. 281–291): BERTRAND RUSSELL. – A rather popular résumé of the author's views on infinity, continuity, implication, deduction, and the status of mathematics. *Une réimpression de Cournot* (pp. 292–295): L. LEVY BRUHL. – An analysis of the conditions that delayed the recognition of Cournot's real eminence. *Sur quelques textes de Bacon et de Descartes* (pp. 296–311): P. TISSERAND. – Texts are cited showing Descartes's debt to Bacon in the "Discourse on Method." *Dieu dans la philosophie de Lagneau* (pp. 312–351): P. TISSERAND. – An historical study of the proofs of God's existence accepted by Lagneau. *Etudes critiques. Le criticisme de J. F. Fries et le problème de la connaissance:* A. KRONFELT. *Discussions. Sociologie théoretique et sociologie pratique ou réformiste:* A. FOUILLÉE. *Sur le principe de l'induction mathématique:* E. WICKERSHEIMER. *Sur le principe de l'induction mathématique:* G. VACCA. *Sur le principe de l'induction mathématique:* A. PADUA. *Enseignement. Une leçon de logique:* R. AUDIERNE. *Questions pratiques. Supplément.*

Smith, William Benjamin. Ecce Deus. Jena: Eugen Diederichs Verlag. 1911. Pp. xvi + 316. M. 5.

Smith, William Benjamin. Der vorchristliche Jesus. Jena: Eugen Diederichs Verlag. 1911. Pp. xxxi + 243. M. 4.50.

NOTES AND NEWS

PROFESSOR E. G. SPAULDING, secretary of the American Philosophical Association, sends us the following preliminary report of the forthcoming annual meeting of that Association: The meeting will be held in Cambridge, in acceptance of the invitation of the philosophical department of

Harvard University, probably on December 27, 28, and 29. The topic which has been selected as the leading subject for discussion is "The Relation of Consciousness, Organ, and Object in Perception." Leaders will be chosen for this discussion, and these leaders, together with the president, will act as a committee to formulate propositions and definitions on the subject, and these will be made known to the members of the Association as early as possible. In addition to the above subject, four others have appeared as seemingly representing, judged by the automatic vote of the Association, topics of dominant interest to the members. Accordingly the executive committee has decided to introduce the innovation of asking for papers on these subjects, with the distinct understanding, however, that this action is not intended to exclude papers on other subjects. These four subjects are as follows: (1) "The Nature of Cause and the Place of the Conception in Metaphysics"; (2) "What, precisely, are we to understand by the term Evolution?" (3) "The Nature of Logic. Does the study of the subject deal with thought processes, or with quite non-mental terms and relations?" (4) "Do persistent illusions presuppose consciousness? If so, what consequences follow?" Members are invited to submit papers on these or other subjects at any time previous to November 20, and are requested to send along with the title a brief outline.

PROFESSOR BALDWIN, editor of the "Dictionary of Philosophy and Psychology" (Macmillans), informs us that the "new edition corrected" recently put upon the market is not a revised edition. The new edition was printed without consulting him, the changes being reported to him as "certain corrections received by the Oxford Press (the printers) after the first edition was printed"; that is, certain *corrigenda* have been incorporated. He himself deprecates the use of the term "new edition" for a mere reprint, especially if the date of issue, which is generally taken to be the date of original publication, is changed on the title page.

THE council of the Royal Anthropological Institute of Great Britain and Ireland sent to the recent Imperial Conference in London a memorial urging the establishment of an Imperial Bureau of Anthropology. The proposal is that the bureau should be established in London and that it should be managed by a committee composed of the council of the Royal Anthropological Institute and representatives of the governments of the British Dominions, of the Indian and Colonial Offices, and of those universities in Great Britain, in India, and the colonies and dependencies of the empire where anthropology is systematically studied.

A NOTABLE addition to the facilities offered by Paris as a center of anthropological research is the Institute of Human Paleontology recently founded by the Prince of Monaco. In the new institute the Abbé H. Breuil, formerly of the University of Fribourg, occupies the chair of prehistoric ethnography, and Dr. H. Obermaier, a former colleague of Professor Hoernes at Vienna, that of geology in its relation to prehistory. Professor M. Boule, of the Museum of Natural History, Jardin des Plantes, is the director.